

CHAPTER 33-10-05
RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL
RADIOGRAPHIC OPERATIONS

Section	
33-10-05-01	Purpose
33-10-05-02	Scope
33-10-05-03	Definitions
33-10-05-03.1	Exemptions
33-10-05-04	Equipment Control
33-10-05-04.1	Exemptions [Repealed]
33-10-05-05	Personal Radiation Safety Requirements for Radiographic Personnel
33-10-05-06	Precautionary Procedures in Radiographic Operations
33-10-05-07	Additional Recordkeeping Requirements

33-10-05-01. Purpose. This chapter establishes radiation safety requirements for persons utilizing sources of radiation for industrial radiography. The requirements of this chapter are in addition to, and not in substitution for, the other applicable requirements of this article.

History: Amended effective June 1, 1986; June 1, 1992.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-20.1-03, 23-20.1-04

33-10-05-02. Scope. This chapter applies to all licensees or registrants who use sources of radiation for industrial radiography. Except for those requirements of this chapter clearly applicable only to sealed radioactive sources, both radiation machines and sealed radioactive sources are covered by this chapter. This chapter does not apply to medical uses of radioactive material.

History: Amended effective June 1, 1992; March 1, 2003.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-20.1-03, 23-20.1-04

33-10-05-03. Definitions. As used in this chapter, the following definitions apply:

1. "Annual refresher safety training" means a review conducted or provided by the licensee or registrant for its employees on radiation safety aspects of industrial radiography. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, new or revised regulations, accidents or errors that have been observed, and should also provide opportunities for employees to ask safety questions.
2. "Associated equipment" means equipment that is used in conjunction with a radiographic exposure device to make radiographic exposures that drives, guides, or comes in contact with the source, e.g., guide

tube, control tube, control or drive cable, removable source stop, J tube and collimator when it is used as an exposure head.

3. "Cabinet radiography" means industrial radiography conducted in an enclosure or cabinet shielded so that radiation levels at every location on the exterior meets the dose limits for individual members of the public as specified in subsection 1 of section 33-10-04.1-07.
4. "Cabinet X-ray system" means an X-ray system with the X-ray tube installed in an enclosure independent of existing architectural structures except the floor on which it may be placed. The cabinet X-ray system is intended to contain at least that portion of a material being irradiated, provide radiation attenuation, and exclude personnel from its interior during generation of ionizing radiation. Included are all X-ray systems designed primarily for the inspection of carry-on baggage at airline, railroad, and bus terminals, and in similar facilities. An X-ray tube used within a shielded part of a building, or X-ray equipment which may temporarily or occasionally incorporate portable shielding, is not considered a cabinet X-ray system.
5. "Certified cabinet X-ray system" means an X-ray system which has been certified in accordance with 21 CFR 1010.2 as being manufactured and assembled pursuant to the provisions of 21 CFR 1020.40.
6. "Certifying entity" means an independent certifying organization or an agreement state whose industrial radiographer certification program has been reviewed and found to meet the applicable parts of appendix B of this chapter or an independent certifying organization or radiation control agency whose X-ray or combination certification requirements, or both, have been reviewed and found to be equivalent to criteria established by the conference of radiation control program directors.
7. "Collimator" means a radiation shield that is placed on the end of the guide tube or directly onto a radiographic exposure device to restrict the size of the radiation beam when the sealed source is cranked into position to make a radiographic exposure.
8. "Control or drive cable" means the cable that is connected to the source assembly and used to drive the source to and from the exposure location.
9. "Control drive mechanism" means a device that enables the source assembly to be moved into and out of the exposure device.
10. "Control tube" means a protective sheath for guiding the control cable. The control tube connects the control drive mechanism to the radiographic exposure device.

11. "Exposure head" means a device that locates the gamma radiography sealed source in the selected working position. An exposure head is also known as a source stop.
12. "Field station" means a facility where licensed material may be stored or used and from which equipment is dispatched.
13. "Guide tube" or "projection sheath" means a flexible or rigid tube, i.e., J tube for guiding the source assembly and the attached control cable from the exposure device to the exposure head. The guide tube may also include the connections necessary for attachment to the exposure device and to the exposure head.
14. "Hands-on experience" means experience in all of those areas considered to be directly involved in the radiography process including, but not limited to, taking radiographs, calibration of survey instruments, operational and performance testing of survey instruments and devices, film development, posting of radiation areas, transportation of radiography equipment, posting of records and radiation area surveillance, etc., as applicable. Excessive time spent in only one or two of these areas, such as film development or radiation area surveillance, should not be counted toward the hours of hands-on experience required for a radiation safety officer or radiographer.
15. "Independent certifying organization" means an independent organization that meets the definition of certifying entity in this section.
16. "Industrial radiography" or "radiography" means the examination of the structure of materials by nondestructive methods using sources of ionizing radiation to produce radiographic images.
17. "Lay-barge radiography" means industrial radiography performed on any water vessel used for laying pipe.
18. "Lixiscope" means a portable light-intensified imaging device using a sealed source.
19. "Offshore platform radiography" means industrial radiography conducted from a platform over a body of water.
20. "Permanent radiographic installation" means an enclosed shielded room, cell, or vault, not located at a temporary jobsite, in which radiography is performed and meets all of the requirements of subsection 10 of section 33-10-05-04.
21. "Personal supervision" means guidance and instruction provided to a radiographer's assistant by a qualified radiographer who is physically present at the site, in visual contact with the assistant while the assistant

is using sources of radiation and associated equipment, and in such proximity that immediate assistance can be given if required.

22. "Practical examination" means a demonstration through practical application of the safety rules and principles in industrial radiography, including use of all appropriate equipment and procedures.
23. "Radiation safety officer for industrial radiography" means an individual with the knowledge of and responsibility for the overall radiation safety program, who has the authority to enforce the appropriate radiation protection rules, standards and practices on behalf of the licensee, and who meets the requirements of subsection 2 of section 33-10-05-05.
24. "Radiographer" means any individual who has successfully completed the training, testing, and documentation requirements of this chapter, and who performs or who in attendance at the site where the sealed source or sources are being used personally supervises industrial radiographic operations and who is responsible to the licensee or registrant for assuring compliance with the requirements of this article and all license or certificate of registration conditions.
25. "Radiographer's assistant" means any individual who under the direct supervision of a radiographer, uses radiographic exposure devices, sealed sources or related handling tools, sources of radiation or radiation survey instruments in industrial radiography.
26. "Radiographer certification" means written approval received from a certifying entity stating that an individual has satisfactorily met certain established radiation safety, testing, and experience criteria as specified in this chapter.
27. "Radiographic exposure device" also called a camera or a projector means any instrument containing a sealed source fastened or contained therein, in which the sealed source or shielding thereof may be moved, or otherwise changed, from a shielded to unshielded position for purposes of making a radiographic exposure.
28. "Radiographic operations" means all activities associated with the presence of radioactive sources in a radiographic exposure device or with a radiation machine. Activities include, but are not limited to using, transporting except when being transported by a common or contract carrier, or storing at a temporary jobsite, performing surveys to confirm the adequacy of boundaries, setting up equipment, and any activity inside restricted area boundaries. Transporting a radiation machine is not considered a radiographic operation.
29. "Radiographic personnel" means any radiographer or radiographer's assistant.

30. "Residential location" means any area where structures in which people lodge or live are located, and the grounds on which such structures are located including, but not limited to, houses, apartments, condominiums, and garages.
31. "S-tube" means a tube through which the radioactive source travels when inside a radiographic exposure device.
32. "Sealed source" means any radioactive material that is encased in a capsule designed to prevent leakage or escape of the radioactive material.
33. "Shielded position" means the location within the radiographic exposure device or source changer where the sealed source is secured and restricted from movement.
34. "Shielded-room radiography" means industrial radiography conducted in a room so shielded that every location on the exterior meets the conditions specified in subsection 1 of section 33-10-04.1-07.
35. "Source assembly" or pig tail means an assembly that consists of the sealed source and a connector that attaches the source to the control cable. The source assembly may also include a stop ball used to secure the source in the shielded position.
36. "Source changer" means a device designed and used for replacement of sealed sources in radiographic exposure devices, including those also used for transporting and storage of sealed sources.
37. "Storage area" means any location, facility, or vehicle that is used to store, transport, or secure a radiographic exposure device, a storage container, a radiation machine, or a sealed source when it is not in use and which is locked or has a physical barrier to prevent accidental exposure, tampering with, or unauthorized removal of the device, machine, container, or sealed source.
38. "Storage container" means a shielded device in which sealed sources are secured and stored.
39. "Temporary jobsite" means a location where radiographic operations are conducted and where sources of radiation may be stored other than those locations of use authorized on the license or registration.
40. "Transport container" means a package that is designed to provide radiation safety and security when sealed sources are transported and which meets all applicable requirements of the United States department of transportation.

41. "Underwater radiography" means industrial radiography performed when the radiographic exposure device or related equipment are beneath the surface of the water.

History: Amended effective October 1, 1982; June 1, 1986; June 1, 1992; March 1, 1994; March 1, 2003.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-20.1-03, 23-20.1-04

33-10-05-03.1. Exemptions.

1. Except for the requirements of subdivisions b and c of subsection 6 of section 33-10-05-06, certified cabinet X-ray systems designed to exclude individuals from the interior of the cabinet are exempt from the requirements of this chapter.
2. Industrial users of lixiscopes are exempt from the requirements of this chapter.

History: Effective March 1, 1994.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-20.1-04

33-10-05-04. Equipment control.

1. **Performance requirements for industrial radiography equipment.** Equipment used in industrial radiographic operations must meet the following minimum criteria:
 - a. Each radiographic exposure device, source assembly, or sealed source, and all associated equipment must meet the requirements specified in American national standards institute (ANSI) N432-1980 "radiological safety for the design and construction of apparatus for gamma radiography", (published in NBS handbook 136, issued January 1981). Engineering analysis may be submitted by an applicant or licensee to demonstrate the applicability of previously performed testing on similar individual radiography equipment components. Upon review, the department may find this an acceptable alternative to actual testing of the component pursuant to the standard.
 - b. In addition to the requirements specified in subdivision a, the following requirements apply to radiographic exposure devices and associated equipment, source changers, source assemblies, and sealed sources.
 - (1) The licensee shall ensure that each radiographic exposure device has attached to it a durable, legible, clearly visible label bearing the:

- (a) Chemical symbol and mass number of the radionuclide in the device;
 - (b) Activity and the date on which this activity was last measured;
 - (c) Model number or product code and serial number of the sealed source;
 - (d) Manufacturer of the sealed source; and
 - (e) Licensee's name, address, and telephone number.
 - (2) Radiographic exposure devices intended for use as type B transport containers must meet the applicable requirements of 10 CFR part 71.
 - (3) Modification of radiographic exposure devices, source changers, and source assemblies and associated equipment is prohibited unless the design of any replacement component, including source holder, source assembly, controls, or guide tubes would not compromise the design safety features of the system.
- c. In addition to the requirements specified in subdivisions a and b, the following requirements apply to radiographic exposure devices, source assemblies, and associated equipment that allow the source to be moved out of the device for radiographic operations or to source changers.
- (1) The coupling between the source assembly and the control cable must be designed in such a manner that the source assembly will not become disconnected if cranked outside the guide tube. The coupling must be such that it cannot be unintentionally disconnected under normal and reasonably foreseeable abnormal conditions.
 - (2) The radiographic exposure device must automatically secure the source assembly when it is cranked back into the fully shielded position within the device. This securing system may only be released by means of a deliberate operation on the exposure device.
 - (3) The outlet fittings, lockbox, and drive cable fittings on each radiographic exposure device must be equipped with safety plugs or covers that must be installed to protect the source assembly from water, mud, sand, or other foreign matter during storage and transportation.

- (4) Each sealed source or source assembly must have attached to it or engraved in it, a durable, legible, visible label with the words: "DANGER RADIOACTIVE". The label must not interfere with the safe operation of the exposure device or associated equipment.
 - (5) The guide tube must be able to withstand a crushing test and a kinking resistance test that closely approximates the crushing and kinking forces likely to be encountered during use.
 - (6) Guide tubes must be used when moving the source out of the radiographic exposure device.
 - (7) An exposure head or similar device designed to prevent the source assembly from passing out of the end of the guide tube must be attached to the outermost end of the guide tube during radiographic operations.
 - (8) The guide tube exposure head connection must be able to withstand the tensile test for control units specified in American national standards institute N432-1980.
 - (9) Source changers must provide a system for ensuring that the source will not be accidentally withdrawn from the changer when connecting or disconnecting the control cable to or from a source assembly.
- d. Notwithstanding subdivision a, equipment used in industrial radiographic operations need not comply with section 8.9.2(c) of the endurance test in American national standards institute N432-1980, if the prototype equipment has been tested using a torque value representative of the torque that an individual using the radiography equipment can realistically exert on the lever or crankshaft of the control drive mechanism.
2. **Limits on external radiation levels from radiographic exposure devices, storage containers, and source changers.** The maximum exposure rate limits for radiograph exposure devices, storage containers, and source changers are two millisieverts [200 millirems] per hour at any exterior surface, and one-tenth millisievert [10 millirems] per hour at one meter from any exterior surface with the sealed source in the shielded position.
3. **Locking of radiographic exposure devices, storage containers, and source changers.**
- a. Each radiographic exposure device shall be provided with a lock or lockable outer container designed to prevent unauthorized or

accidental production of radiation or removal or exposure of a sealed source and shall be kept locked (and if a keyed-lock, with the key removed at all times) at all times except when under the direct surveillance of a radiographer or radiographer's assistant, or as may be otherwise authorized pursuant to subsection 1 of section 33-10-05-06. Each storage container and source changer likewise shall be provided with a lock and must be kept locked when containing sealed sources except when the container is under the direct surveillance of a radiographer or radiographer's assistant.

- b. Radiographic exposure devices, source changers, and storage containers, prior to being moved from one location to another and also prior to being secured to a given location, shall be locked and surveyed to assure that the sealed source is in the shielded position.
- c. The sealed source must be secured in its shielded position by locking the exposure device or securing the remote control each time the sealed source is returned to its shielded position. Then a survey must be performed to determine that the sealed source is in the shielded position pursuant to subdivision b of subsection 3 of section 33-10-05-06.
- d. The control panel of each radiation machine shall be equipped with a lock that will prevent the unauthorized use of an x-ray system or the accidental production of radiation. The radiation machine shall be kept locked and the key removed at all times except when under the direct supervision of a radiographer or a radiographer's assistant.

4. Storage precautions.

- a. Locked radiographic exposure devices, source changers, storage containers, and radiation machines shall be physically secured to prevent tampering or removal by unauthorized personnel.
- b. Radiographic exposure devices, source changers, or transport containers that contain radioactive material may not be stored in residential locations. This requirement does not apply to storage of radioactive material in a vehicle in transit for use at temporary jobsites, if the licensee complies with subdivision c and if the vehicle does not constitute a permanent storage location as described in subdivision d.
- c. If a vehicle is to be used for storage of radioactive material, a vehicle survey must be performed after securing radioactive material in the vehicle and before transport to ensure that radiation levels do not

exceed the limits specified in subsection 3 of section 33-10-04.1-16 at the exterior surface of the vehicle.

- d. A storage or use location is permanent if radioactive material is stored at the location for more than ninety days and any one or more of the following applies to the location:

- (1) Telephone service is established by the licensee.
- (2) Industrial radiographic services are advertised for or from the location.
- (3) Industrial radiographic operations are conducted at other sites due to arrangements made from the location.

5. Radiation survey instruments.

- a. The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments to make physical radiation surveys as required by this chapter and chapter 33-10-04.1. Instrumentation required by this subsection must be capable of measuring a range from two hundredths millisievert [2 millirems] per hour through one hundredth sievert [1 rem] per hour.
- b. Each radiation survey instrument shall be calibrated:
 - (1) At energies appropriate for use and at intervals not to exceed six months and after instrument servicing, except for battery changes.
 - (2) Such that accuracy within plus or minus twenty percent can be demonstrated.
 - (3) At two points located approximately one-third and two-thirds of full-scale on each scale for linear scale instruments; at midrange of each decade, and at two points of at least one decade for logarithmic scale instruments; and for digital instruments, at three points between two hundredths and ten millisieverts [2 and 1000 millirems] per hour.
- c. Records of these calibrations must be maintained for three years after the calibration date for inspection by the department.
- d. Each radiation survey instrument must be checked with a radiation source at the beginning of each day of use and at the beginning of each workshift to ensure it is operating properly.

6. Leak testing, repair, tagging, opening, modification, and replacement of sealed sources.

- a. The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing, repair, tagging, opening, or any other modification of any sealed source shall be performed only by persons specifically authorized to do so by the department, the United States nuclear regulatory commission, or any agreement state.
- b. Each sealed source shall be tested for leakage at intervals not to exceed six months. In the absence of a certificate from a transferor that a test has been made within the six-month period prior to the transfer, the sealed source shall not be put into use until tested.
- c. The leak test shall be capable of detecting the presence of one hundred eighty-five becquerels [0.005 microcurie] of removable contamination on the sealed source. An acceptable leak test for sealed sources in the possession of a radiography licensee would be to test at the nearest accessible point to the sealed source storage position, or other appropriate measuring point, by a procedure to be approved pursuant to paragraph 5 of subdivision a of subsection 3 of section 33-10-03-05. Records of leak test results shall be kept in units of becquerels [microcuries] and maintained for inspection by the department for three years after the required leak test is performed.
- d. Any test conducted pursuant to subdivisions b and c which reveals the presence of one hundred eighty-five becquerels [0.005 microcurie] or more of removable radioactive material shall be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the equipment involved from use and shall cause it to be decontaminated and repaired or to be disposed of, in accordance with this article. Within five days after obtaining results of the test, the licensee shall file a report with the department describing the equipment involved, the test results, and the corrective action taken.
- e. Each exposure device using depleted uranium shielding and an S-tube configuration must be tested for depleted uranium contamination at intervals not to exceed twelve months. The analysis must be capable of detecting the presence of one hundred eighty-five becquerels [0.005 microcurie] of radioactive material on the test sample and must be analyzed by a person specifically authorized by the United States nuclear regulatory commission or another agreement state. Should this testing reveal the presence of one hundred eighty-five becquerels [0.005 microcurie] or more of removable depleted uranium contamination, the exposure device must be removed from use until an evaluation

of the wear on the S-tube has been made. Should the evaluation reveal that the S-tube is worn through, the device may not be used again. Depleted uranium shielded devices do not have to be tested for depleted uranium contamination while in storage and not in use. Before using or transferring such a device, however, the device must be tested for depleted uranium contamination if the interval of storage exceeded twelve months. Records of depleted uranium leak tests must be kept in units of becquerels [microcuries] and maintained for inspection by the department for three years after the required test is performed.

7. **Quarterly inventory.** Each licensee shall conduct a physical inventory at intervals not to exceed three months to account for all sealed sources and radiography exposure devices containing depleted uranium received and possessed by the licensee. The records of the inventories shall be maintained for three years from the date of the inventory for inspection by the department and shall include the quantities and kinds of radioactive material, the location of sealed sources, the date of the inventory, the name of the individual conducting the inventory, the manufacturer, the model number, and the serial number.
8. **Utilization logs.** Each licensee or registrant shall maintain current logs, which shall be kept available for inspection by the department for three years from the date of the recorded event, showing for each source of radiation the following information:
 - a. A description, including make, model, and serial number of each radiation machine, sealed source, radiographic exposure device, or transport or storage container in which a sealed source is located.
 - b. The name and signature of the radiographer to whom assigned.
 - c. Locations where used and dates of use.
 - d. The dates each source of radiation is removed from storage and returned to storage.
 - e. For permanent radiographic installations, the dates each radiation machine is energized.

9. Inspection and maintenance.

- a. The radiographer shall perform visual and operability checks on survey meters, radiation machines, radiographic exposure devices, transport and storage containers, associated equipment, and source changers before use on each day the equipment is to be used to ensure that the equipment is in good working condition, that the sources are adequately shielded and that required labeling is present. Survey instrument operability must be performed using check sources or other appropriate means. If equipment problems are found, the equipment must be removed from service until repaired.
- b. Each licensee or registrant shall have written procedures for, and perform:
 - (1) Inspection and routine maintenance of radiation machines, radiographic exposure devices, source changers, associated equipment, transport and storage containers, and survey instruments at intervals not to exceed three months or before the first use thereafter to ensure the proper functioning of components important to safety. Replacement components shall meet design specifications. If equipment problems are found, the equipment must be removed from service until repaired.
 - (2) Inspection and maintenance necessary to maintain the type B packaging used to transport radioactive materials. The inspection and maintenance program must include procedures to assure that type B packages are shipped and maintained in accordance with the certificate of compliance or other approval.
- c. If any inspection conducted pursuant to subdivision a or b reveals damage to components critical to radiation safety, the device shall be removed from service and labeled as defective until replaced or repairs have been made.
- d. Records of inspection and maintenance shall be maintained for inspection by the department for three years from the date the inspection and maintenance is performed. Each licensee shall maintain records of equipment problems found in daily checks and quarterly inspections of radiographic exposure devices, transport and storage containers, associated equipment, source changers, and survey instruments and retain each record for three years after it is made. The record must include the date of check or inspection, name of inspector, equipment involved, any problems found, and what repair or maintenance, if any, was done.

10. **Permanent radiographic installations.** Permanent radiographic installations having high radiation area entrance controls of the type described in subsection 1 of section 33-10-04.1-10 shall also meet the following requirements:

- a. Each entrance that is used for personnel access to the high radiation area shall have either:
 - (1) An entrance control of the type described in section 33-10-04.1-10 that reduces the radiation level upon entry into the area; or
 - (2) Both conspicuous visible and audible warning signals to warn of the presence of radiation. The visible signal shall be activated by radiation whenever the source is exposed or the machine is energized. The audible signal shall be activated when an attempt is made to enter the installation while the source is exposed or the machine is energized.
- b. The control device or alarm system must be tested for proper operation with a radiation source each day before the installation is used for radiographic operations. The test must include a check of both the visible and audible signals. Entrance control devices that reduce the radiation level upon entry must be tested monthly. If an entrance control device or an alarm is operating improperly, it must be immediately labeled as defective and repaired within seven calendar days. The facility may continue to be used during this seven-day period, provided the licensee or registrant implements continuous surveillance and uses an alarm ratemeter. Records of these tests shall be maintained for inspection by the department for three years from the date the tests were conducted.

11. **Reporting requirements.**

- a. In addition to the reporting requirements specified in subsection 5 of section 33-10-04.1-16 and under other sections of this chapter, each licensee or registrant shall provide a written report to the department, within thirty days of the occurrence of any of the following incidents involving radiographic equipment:
 - (1) Unintentional disconnection of the source assembly from the control cable.
 - (2) Inability to retract the source assembly to its fully shielded position and secure it in this position.
 - (3) Failure of any component (critical to safe operation of the radiographic exposure device) to properly perform its intended function.

- (4) An indicator on a radiation machine fails to show that radiation is being produced, and exposure switch fails to terminate production of radiation when moved to the off position, or a safety interlock fails to terminate x-ray production.
- b. The licensee or registrant shall include the following information in each report submitted under subdivision a:
 - (1) A description of the equipment problem.
 - (2) Cause of each incident, if known.
 - (3) Manufacturer, model number, and serial number of equipment involved in the incident.
 - (4) Place, time, and date of the incident.
 - (5) Actions taken to establish normal operations.
 - (6) Corrective actions taken or planned to prevent recurrence.
 - (7) Names and qualifications of personnel involved in the incident.
- c. Reports of overexposure submitted under subsection 3 of section 33-10-04.1-16 which involve failure of safety components of radiography equipment must also include the information specified in subdivision b.
- d. Any licensee conducting radiographic operations or storing radioactive material at any location not listed on the license for a period in excess of one hundred eighty days in a calendar year, shall notify the department prior to exceeding the one hundred eighty days.

12. **Labeling, storage, and transportation.**

- a. The licensee may not use a radiographic exposure device, source changer, or a container to store licensed material unless the radiographic exposure device, source changer, or the storage container has securely attached to it a durable, legible, and clearly visible label bearing the standard trefoil radiation caution symbol conventional colors, i.e., magenta, purple, or black on a yellow background, having a minimum diameter of twenty-five millimeters, and the wording:

CAUTION* - RADIOACTIVE MATERIAL
 NOTIFY CIVIL AUTHORITIES (or "NAME OF COMPANY")
 * or "DANGER"

- b. The licensee may not transport licensed material unless the material is packaged, and the package is labeled, marked, and accompanied with appropriate shipping papers in accordance with regulations set out in chapter 33-10-13.
- c. Locked radiographic exposure devices, radiation machines, source changers, and storage containers must be physically secured to prevent tampering or removal by unauthorized personnel. The licensee shall store licensed material in a manner which will minimize danger from explosion or fire.
- d. The licensee shall lock and physically secure the transport package containing licensed material in the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal of the licensed material from the vehicle.

History: Amended effective October 1, 1982; June 1, 1986; June 1, 1992; March 1, 1994; May 1, 1998; March 1, 2003.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-20.1-03, 23-20.1-04

33-10-05-04.1. Exemptions. Repealed effective March 1, 1994.

33-10-05-05. Personal radiation safety requirements for radiographic personnel.

1. Conducting industrial radiographic operations.

- a. Whenever radiography is performed at a location other than a permanent radiographic installation, the radiographer must be accompanied by at least one other qualified radiographer or an individual who has at a minimum met the requirements for and is designated as a radiographer's assistant. The additional qualified individual shall observe the operations and be capable of providing immediate assistance to prevent unauthorized entry. Radiography may not be performed if only one qualified individual is present.
- b. All radiographic operations conducted at locations of use authorized in the license must be conducted within a permanent radiographic installation, unless specifically authorized by the department.
- c. A licensee may conduct lay-barge, offshore platform, or underwater radiography only if procedures have been approved by the department, the United States nuclear regulatory commission, or by another agreement state.

- d. Except when physically impossible, collimators shall be used in industrial radiographic operations that use radiographic exposure devices that allow the source to be moved out of the device.
2. **Radiation safety officer for industrial radiography.** The radiation safety officer shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the licensee's or registrant's program.
- a. The minimum qualifications, training, and experience for radiation safety officers for industrial radiography are as follows:
 - (1) Completion of the training and testing requirements of subsection 3;
 - (2) Two thousand hours of hands-on experience as a qualified radiographer in industrial radiographic operations; and
 - (3) Formal training in the establishment and maintenance of a radiation protection program.
 - b. The department will consider alternatives when the radiation safety officer has appropriate training and experience in the field of ionizing radiation, and in addition, has adequate experience and knowledge with respect to the establishment and maintenance of a radiation safety protection program.
 - c. The specific duties and authorities of the radiation safety officer include, but are not limited to:
 - (1) Establishing and overseeing all operating, emergency, and ALARA procedures as required by this article, and reviewing them regularly to ensure that the procedures in use conform to department regulations and to the license or registration conditions;
 - (2) Overseeing and approving all phases of the training program for radiographic personnel, ensuring that appropriate and effective radiation protection practices are taught;
 - (3) Ensuring that required radiation surveys and leak tests are performed and documented in accordance with the regulations, including any corrective measures when levels of radiation exceed established limits;
 - (4) Ensuring that personnel monitoring devices are calibrated and used properly by occupationally exposed personnel, that

records are kept of the monitoring results, and that timely notifications are made as required by subsection 5; and

- (5) Ensuring that operations are conducted safely and to assume control for instituting corrective actions, including stopping of operations when necessary.

3. Training and testing.

- a. The licensee or registrant shall not permit any individual to act as a radiographer's assistant until the individual:
 - (1) Has received copies of and completed a course of at least forty hours on the subjects outlined in appendix A of this chapter, the rules contained in this chapter and in the applicable sections of chapters 33-10-03, 33-10-04.1, and 33-10-10, the applicable United States department of transportation regulations as referenced in chapter 33-10-13, the appropriate department license or certificate of registration; and the licensee's or registrant's operating and emergency procedures. The course shall be one that has been accepted by the department, another state radiation control agency, or the United States nuclear regulatory commission;
 - (2) Has developed competence to use, under the personal supervision of the radiographer, the radiographic exposure devices, sealed sources, associated equipment, radiation machines, and radiation survey instruments that the assistant will use;
 - (3) Has demonstrated understanding of the instructions provided under paragraph 1 by successfully completing a written test administered by the licensee or registrant on the subjects covered and has demonstrated competence in the use of hardware described in paragraph 2 by successful completion of a practical examination administered by the licensee or registrant on the use of such hardware; and
 - (4) Has demonstrated an understanding of the licensee's or registrant's operating and emergency procedures.
- b. The licensee or registrant shall not permit any individual to act as a radiographer, as defined in this chapter, unless such individual:
 - (1) Has met the requirements of subdivision a of subsection 3;
 - (2) Has completed at least two months of on-the-job training as a radiographer's assistant following completion of the

requirements of subdivision a of subsection 3 (Note: This requirement does not apply to individuals designated as radiographers prior to March 1, 1992);

- (3) Has received training in the use of the licensee's or registrant's radiographic exposure devices, radiation machines, sealed sources, in the daily inspection of devices and associated equipment, and in the use of radiation survey instruments;
 - (4) Has demonstrated competence in the use of sources of radiation, radiographic exposure devices, related handling tools, and radiation survey instruments that may be employed in industrial radiographic assignments by successful completion of a practical examination administered by the licensee or registrant covering this material;
 - (5) Has successfully completed, within the last five years, a radiographer certification examination administered by the department or another certifying entity that affords the same or comparable certification standards of this chapter of the North Dakota radiological health rules; and
 - (6) Possesses a current industrial radiographer certification identification card issued pursuant to subsection 7 by the department or other certifying entity that affords the same or comparable certification standards of this chapter of the North Dakota radiological health rules.
- c. The licensee or registrant shall provide annual refresher safety training for each radiographer and radiographer's assistant at intervals not to exceed twelve months.
- d. Except as provided in paragraph 4, the radiation safety officer or designee shall conduct an inspection program of the job performance of each radiographer and radiographer assistant to ensure that regulations, the license or registration requirements, and the applicant's operating and emergency procedures are followed. The inspection program must:
- (1) Include observation of the performance of each radiographer and radiographer's assistant during an actual industrial radiographic operation, at intervals not to exceed six months.
 - (2) Provide that, if a radiographer or a radiographer's assistant has not participated in an industrial radiographic operation for more than six months since the last inspection, the radiographer must demonstrate knowledge of the training requirements of paragraph 3 of subdivision b and the

radiographer's assistant must redemonstrate knowledge of the training requirements of paragraph 2 of subdivision a by a practical examination administered by the licensee or registrant before these individuals can next participate in a radiographic operation.

- (3) The department may consider alternatives if the individual serves as both radiographer and radiation safety officer.
 - (4) If a single individual serves as both radiographer and radiation safety officer and performs all radiography operations, an inspection program is not required.
- e. Each licensee shall maintain the following records of training and certification for three years after the record is made:
- (1) Records of training of each radiographer and each radiographer's assistant. The record must include radiographer certification documents and verification of certification status, copies of written tests, dates of oral and practical examinations, and names of individuals conducting and receiving the oral and practical examinations; and
 - (2) Records of annual refresher safety training and semiannual inspections of job performance for each radiographer and each radiographer's assistant. The records must list the topics discussed during the refresher safety training, the dates the annual refresher safety training was conducted, and names of the instructors and attendees. For inspections of job performance, the records must also include a list showing the items checked and any noncompliances observed by the radiation safety officer.

4. Operating and emergency procedures.

- a. The licensee's or registrant's operating and emergency procedures shall include instructions in at least the following:
- (1) The handling and use of sources of radiation for industrial radiography to be employed such that no individual is likely to be exposed to radiation doses in excess of the limits established in chapter 33-10-04.1.
 - (2) Methods and occasions for conducting radiation surveys.
 - (3) Methods for posting and controlling access to radiographic areas.

- (4) Methods and occasions for locking and securing sources of radiation.
 - (5) Personnel monitoring and the use of personnel monitoring equipment.
 - (6) Transporting sealed sources to field locations, including packing of radiographic exposure devices and storage containers in the vehicles, placarding of vehicles when needed, and controlling of the sealed sources during transportation.
 - (7) Minimizing exposure of individuals in the event of an accident or incident, including a source disconnect, a transport accident, or loss of a source of radiation.
 - (8) The procedure for notifying proper personnel in the event of an accident or incident.
 - (9) Maintenance of records.
 - (10) The inspection, maintenance and operability checks of radiographic exposure devices and associated equipment, survey instruments, alarm ratemeters, transport containers, storage containers, and radiation machines.
 - (11) Steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale or an alarm ratemeter alarms unexpectedly.
 - (12) The procedures for identifying and reporting equipment defects and noncompliant activities.
 - (13) Source recovery procedures if the licensee will perform source recovery.
- b. The licensee or registrant shall maintain copies of current operating and emergency procedures until license or registration termination. Superseded material must be retained for three years after the change has been made.

5. Personnel monitoring.

- a. The licensee or registrant may not permit any individual to act as a radiographer or a radiographer's assistant unless, at all times during radiographic operations, each individual wears, on the trunk of the body, a combination of a direct-reading dosimeter, an operating alarm ratemeter, and an individual monitoring device that is processed and evaluated by an accredited national

voluntary laboratory accreditation program (NVLAP) processor. At permanent radiography installations where other appropriate alarming or warning devices are in routine use, the wearing of an alarming ratemeter is not required.

- (1) Pocket dosimeters must have a range from zero to two millisieverts [200 milliroentgens] and must be recharged at the start of each shift. Electronic personal dosimeters may only be used in place of ion-chamber pocket dosimeters.
 - (2) Each individual monitoring device must be assigned to and worn by only one individual.
 - (3) Individual monitoring devices must be replaced at periods not to exceed one month.
 - (4) After replacement, each individual monitoring device must be processed as soon as possible.
- b. Direct-reading dosimeters, such as pocket dosimeters or electronic personal dosimeters, must be read and the exposures recorded at the beginning and end of each shift, and records must be maintained for inspection by the department for three years from the date of the reading.
 - c. Pocket dosimeters, or electronic personal dosimeters, must be checked at periods not to exceed twelve months for correct response to radiation, and records must be maintained for inspection by the department for three years from the date of the annual response check. Acceptable dosimeters must read within plus or minus twenty percent of the true radiation exposure.
 - d. If an individual's pocket dosimeter is found to be off-scale or if an individual's electronic personal dosimeter reads greater than two millisieverts [200 milliroentgens], and the possibility of radiation exposure cannot be ruled out as the cause, the individual monitoring device must be sent for processing within twenty-four hours. In addition the individual may not resume work associated with the use of sources of radiation until a determination of the individual's radiation exposure has been made. This determination must be made by the radiation safety officer or the radiation safety officer's designee. The results of this determination must be included in the records maintained for inspection by the department until license or registration termination.
 - e. If the individual monitoring device is lost or damaged, the worker shall cease work immediately until a replacement individual monitoring device is provided and the exposure is calculated for the time period from issuance to loss or damage of the individual

monitoring device. The results of the calculated exposure and the time period for which the individual monitoring device was lost or damaged must be included in the records maintained for inspection by the department until license or registration termination.

- f. Reports received from the accredited NVLAP individual monitoring device processor must be retained for inspection by the department until license or registration termination.

9. Each alarm ratemeter must:

- (1) Be checked, without being exposed to radiation, to ensure that the alarm functions properly (sounds) before using at the start of each shift;
- (2) Be set to give an alarm signal at a preset dose rate of five mSv per hour [500 mrem per hour] with an accuracy of plus or minus twenty percent of the true radiation dose rate;
- (3) Require special means to change the preset alarm function; and
- (4) Be calibrated at periods not to exceed twelve months for correct response to radiation. The licensee shall maintain records of alarm ratemeter calibrations for three years from the date of calibration.

6. **Supervision of radiographer assistants.** Whenever a radiographer's assistant uses sources of radiation, including radiation machines, radiographic exposure devices, associated equipment or related handling tools, or sealed sources or conducts radiation surveys required by subdivisions b, c, and e of subsection 3 of section 33-10-05-06 to determine that the sealed source has returned to the shielded position or the radiation machine has stopped producing radiation after an exposure, the radiographer's assistant shall be under the personal supervision of a radiographer. The personal supervision must include:

- a. The radiographer's physical presence at the site where the sources of radiation are being used;
- b. The availability of the radiographer to give immediate assistance if required; and
- c. The radiographer's direct observation of the assistant's performance of the operations referred to in this subsection.

7. Identification card.

- a. A radiographer certification identification card will be issued to each individual who:
 - (1) Provides the department with documentation showing completion of:
 - (a) The radiographer's assistant training requirements in subdivision a of subsection 3.
 - (b) The radiographer on-the-job training and the demonstration of competence requirements in paragraphs 2, 3, and 4 of subdivision b of subsection 3.
 - (2) The requirements in paragraph 1 do not apply to individuals designated as radiographers prior to March 1, 1992.
 - (3) Has successfully completed, within the last five years, the examination required in paragraph 5 of subdivision b of subsection 3.
- b. Suspension, revocation, or denial. A radiographer certification identification card may be suspended, revoked, or denied if:
 - (1) Violations of the requirements of this article are noted.
 - (2) Another certifying entity has revoked, suspended, or denied an identification card for violations of applicable standards.
- c. Expiration of the identification card. The identification card will expire five years from the date that the individual successfully completed the examination required in paragraph 5 of subdivision b of subsection 3.

History: Amended effective October 1, 1982; June 1, 1986; June 1, 1992; March 1, 1994; May 1, 1998; March 1, 2003.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-20.1-03, 23-20.1-04

33-10-05-06. Precautionary procedures in radiographic operations.

- 1. **Security.** During each radiographic operation, the radiographer or other individual present, as required by subsection 1 of section 33-10-05-05, shall maintain continuous direct surveillance of the operation to protect against unauthorized entry into a high radiation area, as defined in chapter 33-10-01, except at permanent radiographic installations where all entry ways are locked and the requirements of subsection 10 of section 33-10-05-04 are met.

2. **Posting.** All areas in which industrial radiography is being performed must be conspicuously posted as required by subsection 2 of section 33-10-04.1-13. Exceptions listed in subsection 3 of section 33-10-04.1-13 do not apply to industrial radiographic operations.
3. **Radiation surveys and survey records.**
 - a. No radiographic operation shall be conducted unless calibrated and operable radiation survey instrumentation, as described in subsection 5 of section 33-10-05-04 is available and used at each site where radiographic exposures are made.
 - b. A survey with a radiation survey instrument shall be made after each radiographic exposure to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device shall be surveyed. If the radiographic exposure device has a source guide tube, the survey shall include the entire length of the guide tube.
 - c. A survey must be made of the storage area as defined in section 33-10-05-03 whenever a radiographic exposure device is being placed in storage.
 - d. A physical radiation survey, as specified in subsection 3 of section 33-10-05-04, shall be made to determine that each sealed source is in its shielded position prior to securing the radiographic exposure device, storage container, or source changer in a storage area as defined in section 33-10-05-03.
 - e. A physical radiation survey shall be made after each radiographic exposure using radiation machines to determine that the machine is not producing radiation.
 - f. All potential radiation areas where industrial radiographic operations are to be performed shall be posted in accordance with subsection 2 of section 33-10-05-06 based on calculated dose rates before industrial radiographic operations begin. An area survey shall be performed during the first radiographic exposure (for example, with the sealed source in the exposed position or when the radiation machine is first energized) to confirm that dose limits are not exceeded.
9. Records shall be kept of the surveys required by subdivisions c and d of subsection 3. Such records shall be maintained for inspection by the department for three years after completion of the survey. If the survey was used to determine an individual's exposure, however, the records of the survey must be maintained until the department authorizes their disposition.

4. **Documents and records required at temporary jobsites.** Each licensee or registrant conducting industrial radiography at a temporary jobsite or field station shall have the following records available at that site for inspection by the department:
- a. Appropriate license or certificate of registration or equivalent document.
 - b. Operating and emergency procedures.
 - c. Applicable rules.
 - d. Survey records required pursuant to subsection 3 for the period of operation at the site.
 - e. Daily pocket dosimeter records for the period of operation at the site.
 - f. The latest instrument calibration and leak test record for specific devices in use at the site. Acceptable records include tags or labels which are affixed to the device or survey meter.
 - g. Utilization records for each radiographic exposure device dispatched from that location.
 - h. Records of equipment problems identified in daily checks of equipment.
 - i. Records of alarm system and entrance control checks if applicable.
 - j. Evidence of the latest calibrations of alarm ratemeters and operability checks of pocket dosimeters or electronic personal dosimeters, or both.
 - k. The shipping papers for transportation of radioactive material.
 - l. When operating under reciprocity, a copy of the United States nuclear regulatory commission or agreement state license authorizing the use of radioactive material.
5. **Specific requirements for radiographic personnel performing industrial radiography.**
- a. At a jobsite, the following must be supplied by the licensee or registrant:
 - (1) At least one operable, calibrated survey instrument for each exposure device or radiation machine in use;

- (2) A current whole body individual monitoring device that is processed and evaluated by an accredited national voluntary laboratory accreditation program (NVLAP) processor for each individual performing radiographic operations;
 - (3) An operable, calibrated pocket dosimeter or electronic personal dosimeter with a range of zero to two millisieverts [200 milliroentgens] for each person performing radiographic operations;
 - (4) An operable, calibrated alarm ratemeter set to give an alarm signal at a preset dose rate of five millisieverts [500 milliroentgens] per hour; and
 - (5) The appropriate barrier ropes and signs.
 - (6) Each radiographer must possess a valid industrial radiographer certification identification card, issued by an approved certifying entity.
- b. Industrial radiographic operations may not be performed if any of the items specified in subdivision a are not available at the jobsite or are inoperable. Persons performing radiographic operations shall ensure that the items listed in subdivision a and radiation exposure devices and radiation machines are used in accordance with the requirements of this section.
 - c. Each licensee or registrant shall provide as a minimum two radiographic personnel when sources of radiation are used at temporary jobsites as described in subsection 1 of section 33-10-05-05.
 - d. No individual other than a radiographer or a radiographer's assistant under the personal supervision of a radiographer may manipulate controls or operate equipment used in industrial radiographic operations.
 - e. During an inspection by the department, the department inspector may terminate an operation if any of the items required in subdivision a are not available or operable, or if the required number of radiographic personnel are not present. Operations may not be resumed until such conditions are met.
6. **Special requirements and exemptions for cabinet radiography.**
- a. Systems for cabinet radiography designed to allow admittance of individuals shall:

- (1) Comply with all applicable requirements of this chapter and subsection 1 of section 33-10-04.1-07. If such a system is a certified cabinet X-ray system, it shall comply with all applicable requirements of this chapter and 21 CFR 1020.40.
 - (2) Be evaluated at intervals not to exceed one year to assure compliance with the applicable requirements as specified in paragraph 1. Records of these evaluations shall be maintained for inspection by the department for a period of three years after the evaluation.
 - b. Certified cabinet X-ray systems designed to exclude individuals from the interior of the cabinet are exempt from the requirements of this chapter except that:
 - (1) Operating personnel must be provided with a personnel dosimeter that is processed and evaluated by an accredited national voluntary laboratory accreditation program (NVLAP) processor and reports of the results must be maintained for inspection by the department.
 - (2) No registrant shall permit any individual to operate a cabinet X-ray system until such individual has received a copy of and instruction in the operating procedures for the unit and has demonstrated competence in its use. Records which demonstrate compliance with this paragraph shall be maintained for inspection by the department until disposition is authorized by the department.
 - (3) Tests for proper operation of high radiation area control devices or alarm systems, where applicable, shall be conducted and recorded in accordance with subsection 10 of section 33-10-05-04.
 - (4) The registrant shall perform an evaluation at intervals not to exceed one year, to determine conformance with subsection 1 of section 33-10-04.1-07. If such a system is a certified cabinet X-ray system, it shall be evaluated at intervals not to exceed one year to determine conformance with 21 CFR 1020.40. Records of these evaluations shall be maintained for inspection by the department for a period of three years after the evaluation.
 - c. Certified cabinet X-ray systems shall be maintained in compliance with 21 CFR 1020.40 unless prior approval has been granted by the department pursuant to subsection 1 of section 33-10-01-05.
7. **Prohibitions.** Industrial radiography performed with a sealed source which is not fastened to or contained in radiographic exposure devices,

known as fishpole radiography, is prohibited unless specifically authorized by the department.

History: Amended effective October 1, 1982; June 1, 1986; June 1, 1992; March 1, 1994; May 1, 1998; March 1, 2003.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-20.1-03, 23-20.1-04

33-10-05-07. Additional recordkeeping requirements.

1. **Records of the specific license for industrial radiography.** Each licensee shall maintain a copy of its license, license conditions, documents incorporated by reference, and amendments to each of these items until superseded by new documents approved by the department, or until the department terminates the license.
2. **Records of receipt and transfer of sealed sources.**
 - a. Each licensee shall maintain records showing the receipts and transfers of sealed sources and devices using depleted uranium for shielding and retain each record for three years after it is made.
 - b. These records must include the date, the name of the individual making the record, radionuclide, number of becquerels (curies) or mass (for depleted uranium), and manufacturer, model, and serial number of each sealed source or device, as appropriate.
3. **Form of records.** Each record required by this chapter must be legible throughout the specified retention period. The record may be the original or a reproduced copy or a microform provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of reproducing a clear copy throughout the required retention period. The record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records, such as letters, drawings, and specifications, must include all pertinent information, such as stamps, initials, and signatures. The licensee shall maintain adequate safeguards against tampering with and loss of records.
4. **Location of documents and records.**
 - a. Each licensee shall maintain copies of records required by this chapter and other applicable chapters of this article at the location specified in paragraph 11 of subdivision a of subsection 3 of section 33-10-03-05.

- b. The documents and records required at each field station and each temporary jobsite are specified in subsection 4 of section 33-10-05-06.

History: Effective March 1, 2003.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-20.1-03, 23-20.1-04

APPENDIX A

SUBJECTS FOR INSTRUCTION OF RADIOGRAPHER'S ASSISTANTS

Training provided to qualify individuals as radiographer's assistants in compliance with subdivision a of subsection 3 of section 33-10-05-05 shall be presented on a formal basis. The training must include the following subjects:

1. Fundamentals of radiation safety
 - a. Characteristics of gamma and X-ray radiation
 - b. Units of radiation dose (mrem and sievert) and quantity of radioactivity (curie and becquerel)
 - c. Significance of radiation dose
 - (1) Radiation protection standards
 - (2) Biological effects of radiation
 - (3) Case histories of radiography accidents
 - d. Levels of radiation from licensed material
 - e. Methods of controlling radiation dose
 - (1) Working time
 - (2) Working distances
 - (3) Shielding
2. Radiation detection instrumentation to be used
 - a. Use of radiation survey instruments
 - (1) Operation
 - (2) Calibration
 - (3) Limitations
 - b. Survey techniques
 - c. Use of personnel monitoring equipment
 - (1) Personnel dosimeters

- (2) Alarming ratemeters
 - (3) Pocket dosimeters
 - (4) Other monitoring equipment
- 3. The requirements of pertinent federal and state rules and regulations
- 4. The licensee's or registrant's written operating and emergency procedures
- 5. Radiographic equipment to be used
 - a. Remote handling equipment
 - b. Operation and control of radiographic exposure devices and sealed sources, including pictures or models of source assemblies (pigtailed)
 - c. Storage and transport containers, source changers
 - d. Operation and control of X-ray equipment
 - e. Collimators
 - f. Storage, control, and disposal of sources of radiation
 - g. Inspection and maintenance of equipment

History: Amended effective October 1, 1982; June 1, 1986; June 1, 1992; March 1, 2003.

APPENDIX B

RADIOGRAPHER CERTIFICATION

- I. **Requirements for an independent certifying organization.** An independent certifying organization shall:
 1. Be an organization such as a society or association whose members participate in, or have an interest in, the fields of industrial radiography;
 2. Make its membership available to the general public nationwide that is not restricted because of race, color, religion, sex, age, national origin, or disability;
 3. Have a certification program open to nonmembers, as well as members;
 4. Be an incorporated, nationally recognized organization that is involved in setting national standards of practice within its fields of expertise;
 5. Have an adequate staff, a viable system for financing its operations, and a policymaking and decisionmaking review board;
 6. Have a set of written organizational bylaws and policies that provide adequate assurance of lack of conflict of interest and a system for monitoring and enforcing those bylaws and policies;
 7. Have a committee, whose members can carry out their responsibilities impartially, to review and approve the certification guidelines and procedures, and to advise the organization's staff in implementing the certification program;
 8. Have a committee, whose members can carry out their responsibilities impartially, to review complaints against certified individuals and to determine appropriate sanctions;
 9. Have written procedures describing all aspects of its certification program, maintain records of the current status of each individual's certification, and the administration of its certification program;
 10. Have procedures to ensure that certified individuals are provided due process with respect to the administration of its certification program, including the process of becoming certified and any sanctions imposed against certified individuals;
 11. Have procedures for proctoring examinations, including qualifications for proctors. These procedures must ensure that the individuals proctoring each examination are not employed

by the same company or corporation (or a wholly-owned subsidiary of such company or corporation) as any of the examinees;

12. Exchange information about certified individuals with the department, the United States nuclear regulatory commission, and other independent certifying organizations or agreement states, or both, and allow periodic review of its certification program and related records; and
13. Provide a description to the department of its procedures for choosing examination sites and for providing an appropriate examination environment.

II. Requirements for certification programs. All certification programs must:

1. Require applicants for certification to receive training in the topics set forth in appendix A or equivalent United States nuclear regulatory commission or agreement state regulations and satisfactorily complete a written examination covering these topics;
2. Require applicants for certification to provide documentation that demonstrates that the applicant has received training in the topics set forth in appendix A or equivalent United States nuclear regulatory commission or agreement state regulations, satisfactorily completed a minimum period of on-the-job training, and has received verification by an agreement state or a United States nuclear regulatory commission licensee that the applicant has demonstrated the capability of independently working as a radiographer;
3. Include procedures to ensure that all examination questions are protected from disclosure;
4. Include procedures for denying an application, revoking, suspending, and reinstating a certificate;
5. Provide a certification period of not less than three years nor more than five years;
6. Include procedures for renewing certifications and, if the procedures allow renewals without examination, require evidence of recent full-time employment and annual refresher training; and
7. Provide a timely response to inquiries, by telephone or letter, from members of the public, about an individual's certification status.

III. Requirements for written examinations. All examinations must be:

1. Designed to test an individual's knowledge and understanding of the topics listed in appendix A or equivalent agreement state requirements;
2. Written in a multiple-choice format; and
3. Have test items drawn from a question bank containing psychometrically valid questions based on the material in appendix A.

History: Effective March 1, 2003.

General Authority: NDCC 23-20.1-04

Law Implemented: NDCC 23-10.1-03, 23-10.1-04